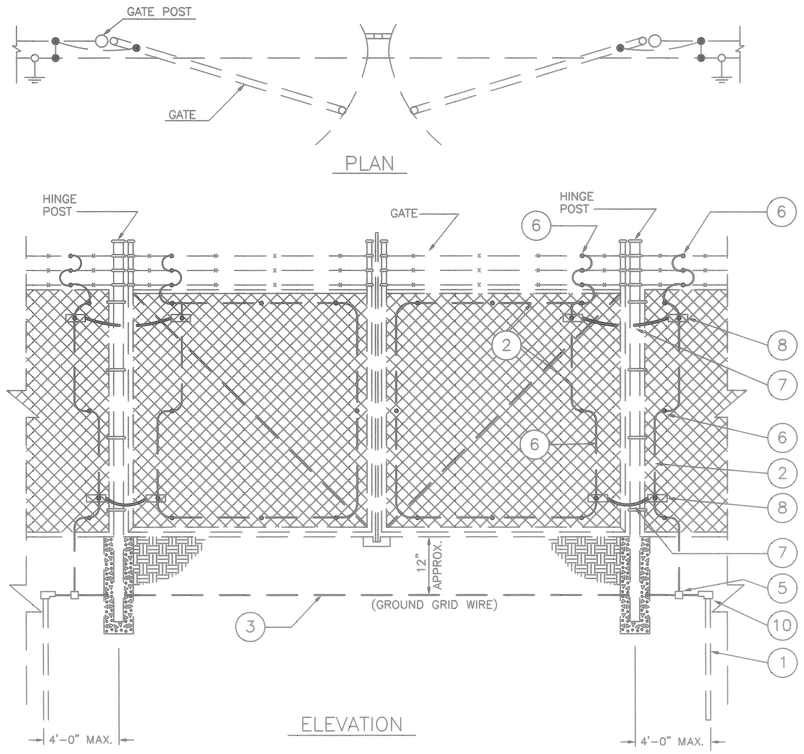
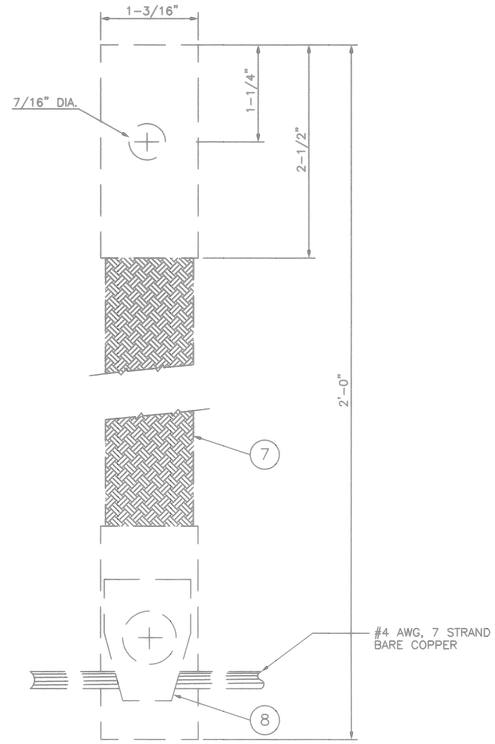
DRAWING NUMBER X-2208-11-C



ELEVATION

FENCE GROUNDING DETAIL

N.T.S.



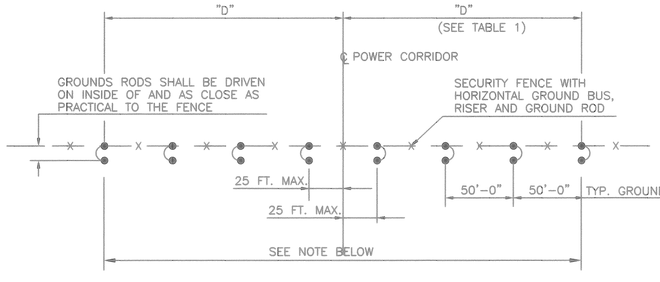
FLEXIBLE BONDING STRAP FOR GATE GROUNDING

N.T.S.

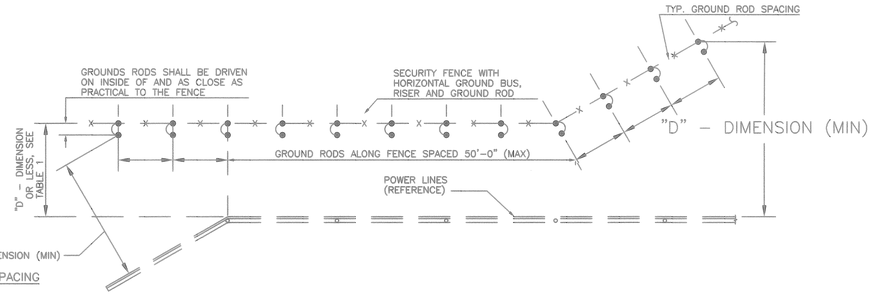
MATERIAL LIST	
ITEM	DESCRIPTION
①	GROUND ROD 3/4" X 8' COPPERWELD JOSLYN J9168 W/(1) J-9183
②	#4 AWG, 7 STRAND, FULLY ANNEALED, SOFT BARE COPPER
③	#1/0 AWG, 7 STRAND, FULLY ANNEALED, SOFT BARE COPPER
④	CONNECTION #1/0 AWG TO PIPE BURNDY TYPE GAR SIZE TO SUIT
⑤	CONNECTION #1/0 AWG RUN TO #4 AWG TAP CADWELD TO TAC-2CIL
⑥	SPLIT BOLT CONNECTOR FOR #4 AWG TO #6 AWG GALVANIZED STEEL FENCE FABRIC BURNDY SERVIT KS22 OR APPROVED EQUAL
⑦	FLEXIBLE COPPER BRAID 1-3/16" W X 24" LONG WITH 2-1/2" END FERRULES, EACH WITH ONE 7/16" BOLT HOLE, BURNDY BD24 OR APPROVED EQUAL
⑧	CONNECTION FOR #4 AWG TO BRAID FERRULE AND FENCE, BURNDY GB26 OR APPROVED EQUAL
⑨	CONNECTION #4 AWG TO 3/4" GROUND ROD CADWELD GRC-181L
⑩	CONNECTION #1/0 AWG TO 3/4" GROUND ROD CADWELD GRC-182C OR APPROVED EQUAL
⑪	CONNECTION #4/0 AWG TO #4/0 AWG STRANDED CABLES CADWELD PCC-2Q2Q OR APPROVED EQUAL

TABLE 1

GROUND ROD SPACING	
POWER CORRIDORS (KILOVOLTS)	DIMENSION - D SHORTEST DISTANCE FROM FENCE TO CENTER OF POWER LINE
2.3 TO 44	25 FT.
69 TO 115	50 FT.
138 TO 161	75 FT.
230 TO 289	100 FT.
290 & ABOVE	150 FT.

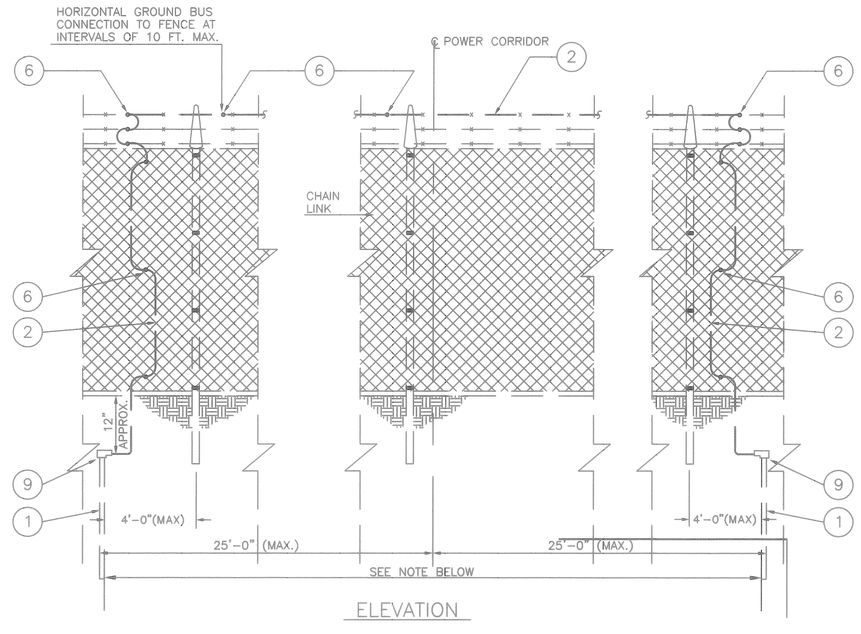


PLAN



ELECTRICAL LINES PARALLELING FENCE LINES (SEE TABLE 1)

N.T.S.

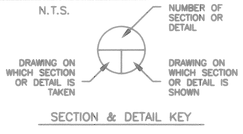


ELEVATION

NOTE:
1. FOR FENCE FREE FROM ELECTRICAL POWER LINE CROSSINGS OR PARALLELS, GROUNDING SPACING SHALL BE SPACED AT 500 FEET INTERVALS

ELECTRICAL POWER LINES CROSSING FENCE (SEE TABLE 1)

N.T.S.



SECTION & DETAIL KEY

INFORMATION CONTAINED WITHIN DOES NOT CONTAIN EXPORT CONTROLLED INFORMATION
Reviewer(Signature) [signature] Date 4/2/14

APPROVED FOR RELEASE
H.H. THOMAS
DATE 4/27/14

REFERENCE DRAWINGS	OPEN CHANGES	REV	REVISION DESCRIPTION	DWN	CHK	DESIGN MANAGER	DATE
		A	CFC PER ESO E4805	SMW	RAD	[signature]	4/04/14

AUTOCAD

Fluor-B&W | Portsmouth
P.O. BOX 548 PIKETON, OHIO 45661

CONTRACT DEAC3010CC40017
DRAWN BY S.M. WILLIAMS
CHECKED BY L.S. DOWNARD
MM/RED R.A. DEPUE 4/16/14
DESIGN MANAGER [signature] 4/04/14
SCALE NTS

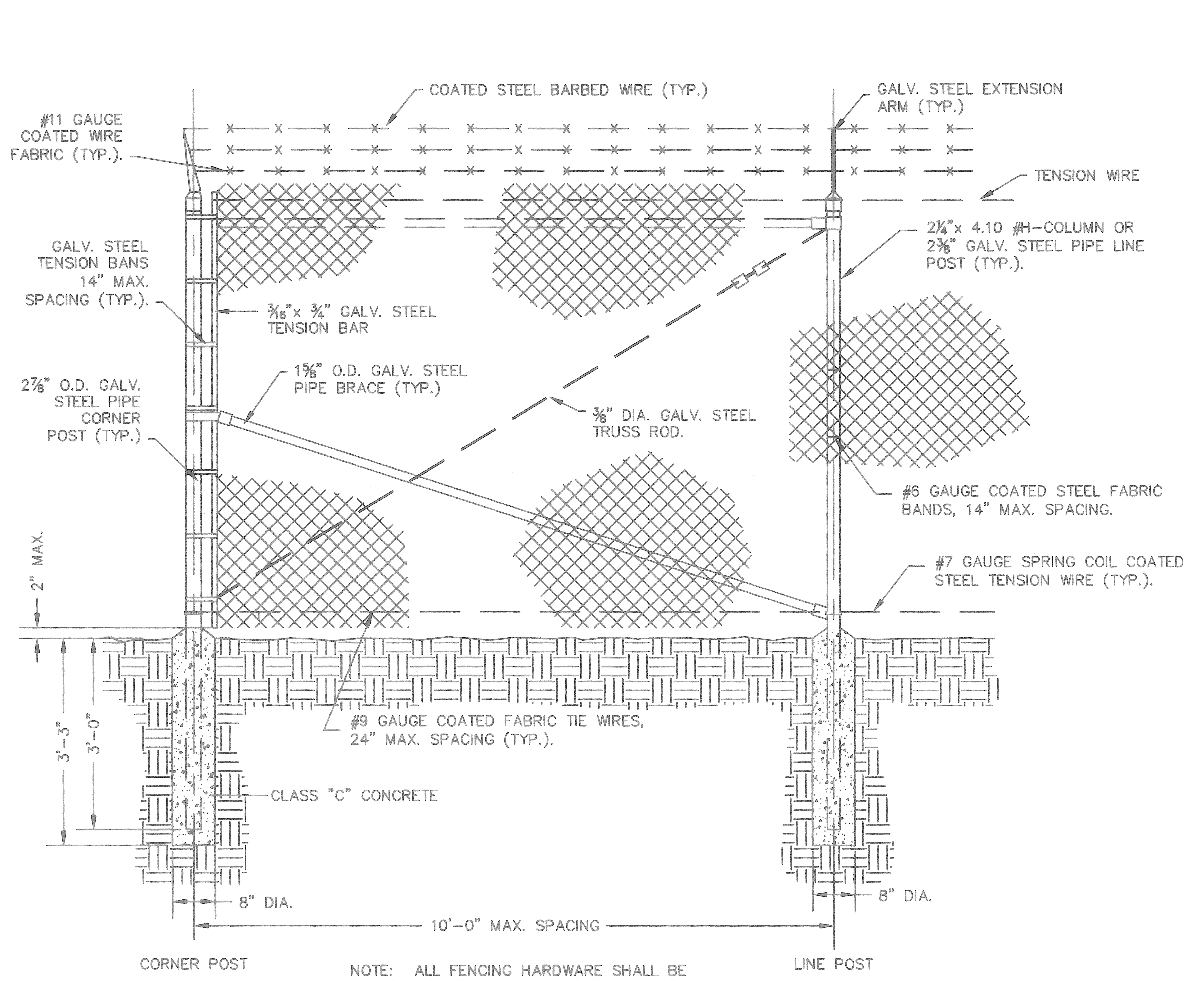
PORTSMOUTH GASEOUS DIFFUSION PLANT
D & D PROJECT

PARKING LOT UPGRADE
X-1000 SOUTH LOT
FENCE GROUNDING DETAILS

FACILITY X-2208
DRAWING NUMBER X-2208-11-C
A

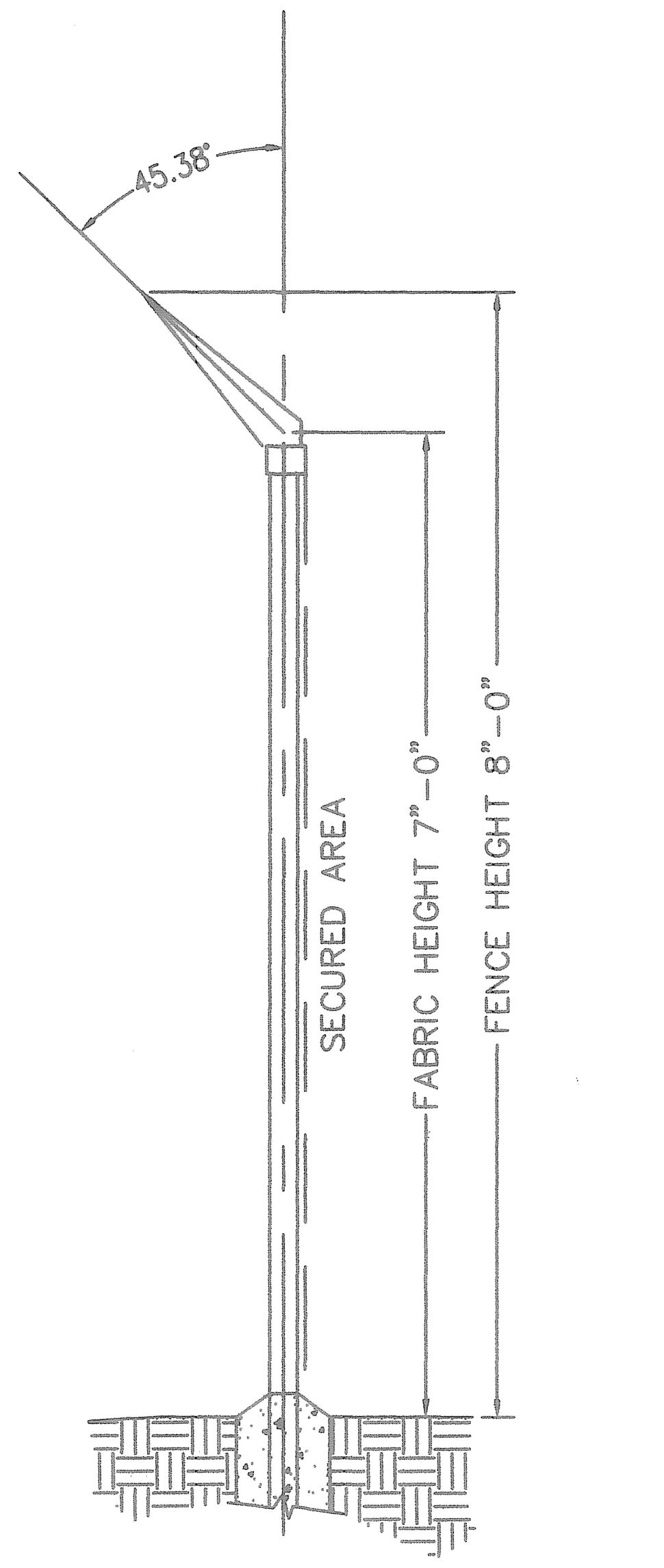
X-2208-12-C
DRAWING NUMBER

NOTES:
1) SEE FBP CSPEC-02444 REV. 1 FOR MATERIALS & INSTALLATION

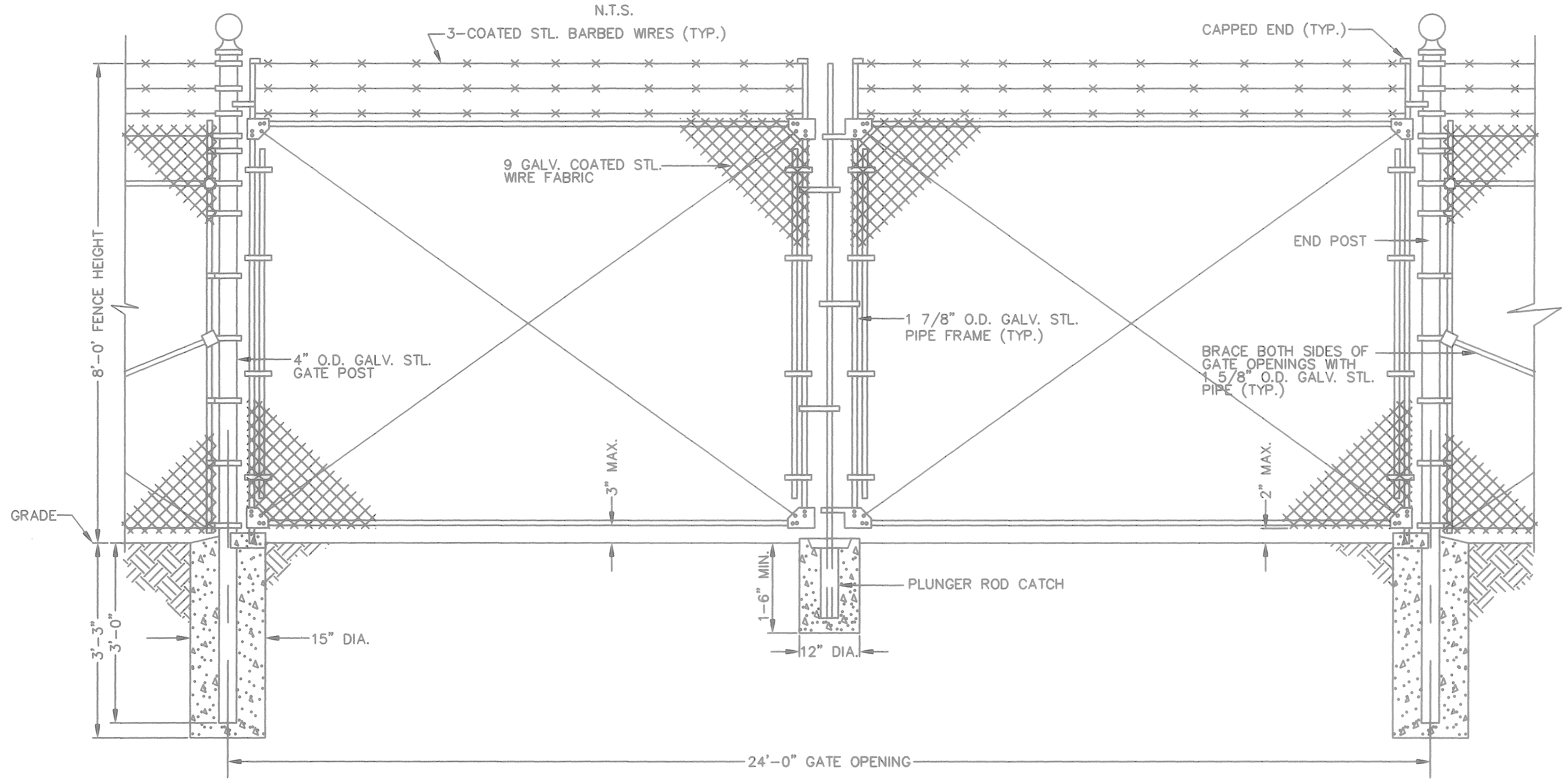


NOTE: ALL FENCING HARDWARE SHALL BE INSIDE SECURE AREA, ALL BOLTS WILL BE SPOT WELDED OR PEENED.

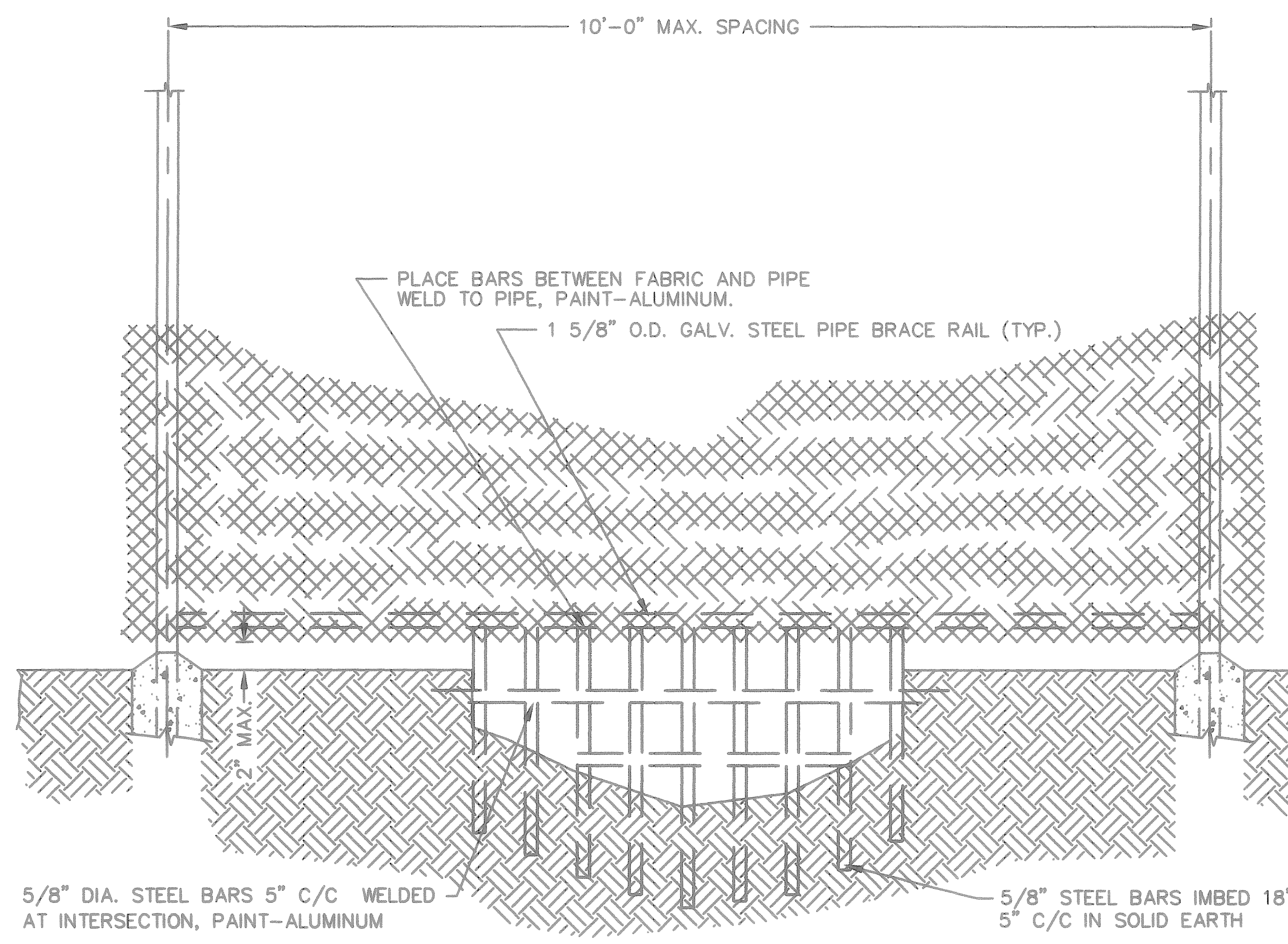
TYPICAL SECURITY FENCE DETAIL
N.T.S.



ELEV. OF LINE POST
N.T.S.



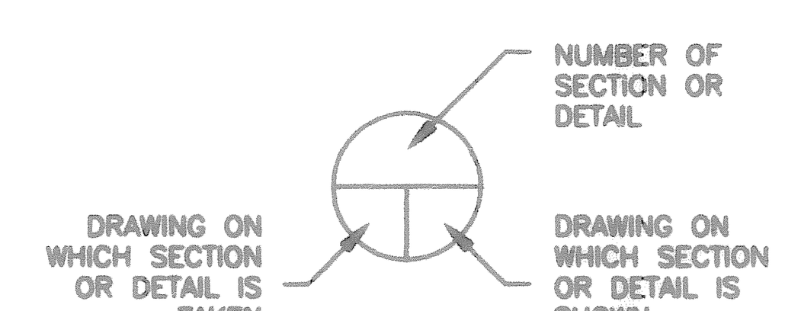
DOUBLE LEAF GATE DETAIL
N.T.S.



FENCING ACROSS SWALE DETAIL
N.T.S.

INFORMATION CONTAINED WITHIN DOES NOT CONTAIN EXPORT CONTROLLED INFORMATION
Reviewer(Signature) [signature] Date 4/23/14

APPROVED FOR RELEASE
H.H. THOMAS
DATE 4/23/14



SECTION & DETAIL KEY

AUTOCAD

REFERENCE DRAWINGS	OPEN CHANGES	REV	REVISION DESCRIPTION	DWN	CHK	DESIGN MANAGER	DATE
		A	CFC PER ESO E4805	SMW	RAD	[signature]	4-24 2014

Fluor-B&W | Portsmouth LLC
P.O. BOX 548 PIKETON, OHIO 45661

NOTICE: THIS DRAWING HAS NOT BEEN PUBLISHED AND IS THE SOLE PROPERTY OF FBP LLC AND IS LENT TO THE BORROWER FOR THEIR CONFIDENTIAL USE ONLY, AND IN CONSIDERATION OF THE LOAN OF THIS DRAWING, THE BORROWER PROMISES AND AGREES TO RETURN IT UPON REQUEST AND AGREES THAT IT WILL NOT BE REPRODUCED, COPIED, LENT OR OTHERWISE DISPOSED OF DIRECTLY OR INDIRECTLY, NOR USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT IS FURNISHED.

CONTRACT DEAC3010CC40017
DRAWN BY S.M. WILLIAMS
CHECKED BY L.S. DOWNARD
MM/RED R.A. DEPUE 4/16/14
DESIGN MANAGER [signature] 4-24 2014
SCALE NTS

PORTSMOUTH GASEOUS DIFFUSION PLANT
D & D PROJECT

PARKING LOT UPGRADE
X-1000 SOUTH LOT
FENCE DETAILS

FACILITY X-2208
DRAWING NUMBER X-2208-12-C
A

FLUOR–B&W | Portsmouth LLC

PIKETON, OHIO

CONSTRUCTION SPECIFICATION 02444

CHAIN LINK FENCE AND GATES

REV	DATE	REASON FOR REVISION	ORIGINATOR	DATE	DESIGN ENGR MGR	DATE
1	1/19/12	REVISED FOR CLARIFICATIONS	Laura Landt	1/19/12	[signature]	1/19/12
0	11/29/11	BASELINE SPECIFICATION	LDG	11/29/11	BJC	11/30/11

Fluor-B&W | Portsmouth

APPROVED FOR RELEASE
B. J. Carlsory
Date: 1/19/12

Addendum to Specifications

SOW #:_____

Construction Specification #:_____

Date: _____

Additions to Specifications:

Deletions to Specifications:

Engineer Date Design Engineering Manager Date

PART 1 - GENERAL

1.01 SCOPE

This section of the specifications includes technical requirements for chain link fence work and related work, complete.

1.02 CODES AND STANDARDS

Codes, specifications and standards which are referred to by number or title shall form a part of this section of the specifications to the extent indicated by the reference thereto.

American Society for Testing and Materials (ASTM) Standards:

A 121	Spec. for Metallic-Coated Carbon Steel Barbed Wire	Rev 1
A 123	Spec. for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products	
A 392	Spec. for Zinc-Coated Steel Chain-Link Fence Fabric	
A 491	Spec. for Aluminum-Coated Steel Chain-Link Fence Fabric	
A 780	Spec. for Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings	
A 817	Spec. for Metallic Wire for Use in Chain Link Fence	
A824	Spec. for Metallic Coated Marcelled Tension Wire for Use with Chain Link Fence Fabric	
F 567	Spec. for Installation of Chain Link Fence	
F 626-08	Spec. for Standard Specification for Fence Fittings	
F 900-05	Spec. for Industrial and Commercial Swing Gates	
F 1043	Spec. for Strength and Protective Coatings on Steel Industrial Chain Link Fence Framework	
F 1083-10	Spec. for Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures	

American Welding Society (AWS): Rev 1

D 19.0-72 Spec. for Welding Zinc Coated Steel.

1.03 DATA SUBMITTAL

Submit data listed in this Section as listed in Appendix A - Submittal Requirements:

Shop Drawings – All fence and gate components with all dimensions, details and finishes. Drawings must include post foundations. Rev 1

Wiring Diagrams – The fence grounding plan with all dimensions, details and finishes and motor operated gates Rev 1

Manufacturer's Product Data – The fence material, equipment, accessories, concrete anchors and touch-up paint. Rev 1

PART 2 - MATERIALS

2.01 FENCING - BASIC

A. Chain Link Fabric – Provide either zinc coated wire per ASTM A 392 or aluminum coated steel wire per ASTM A 491, in compliance with the following: Rev 1

Gauge - No. 9

Mesh - 2 inch square

Breaking Strength – 1,290 lbf Rev 1

Size - 7 feet wide, unless otherwise indicated, top and bottom selvage edges twisted and barbed

1. Zinc Coating. Comply with ASTM A 392, Class II, with minimum of 2.0 oz. zinc per square foot, evenly distributed on fabric. Galvanized after weaving.

2. Aluminum Coating. Comply with ASTM A 491, Class I, with minimum of 0.40 oz. aluminum per square foot, evenly distributed on fabric.

B. Posts. Galvanized pipe, ASTM A 120.

Use	Size, O.D.	Weight, Lbs. Minimum Per Lineal Foot
End, Corner, Pull	2-7/8 in	5.79
Line	2-3/8 in	3.65
Gate, Swing, (Each Leaf)		
6 ft.-0 in. wide, and less	2-7/8 in	5.79
6 ft.-0 in. thru 13 ft.-0 in. wide	4 in	9.11
13 ft.-0 in. thru 18 ft.-0 in. wide	6-5/8 in	18.97
Over 18 ft.-0 in.	8-5/8 in	24.70

C. Rails, Top and Bottom, and Bracing. Galvanized pipe, ASTM F1043, 1-5/8 in. O.D., weight 2.27 lbs. per lineal foot | Rev 1

D. Barbed Wire Extension Arms. Extension arms shall be galvanized after assembly and designed to carry three strands of barbed wire at a 45° angle with the topmost wire approximately 12 inches above the fabric and approximately 12 inches out from the secured *area* *fence line*.

Extension arms for line posts shall be fabricated entirely of pressed steel or with a malleable iron base and pressed steel arm. Minimum thickness of pressed steel shall be 12 gauge.

Extension arms for corner and end posts shall be of similar construction with provisions for riveting or fastening to posts. Arms shall be fabricated of minimum 12 gauge pressed steel or entirely of heavy malleable iron.

E. Barbed Wire. Barbed wire shall be two strands of 12/-1/2 gauge coated steel with 14 gauge, four point round barbs at 5 inch maximum centers. The coating shall be zinc, conforming to ASTM A 121.

F. Tension Wire. Tension wire shall be aluminum coated or zinc coated 7 gauge spring coil steel wire. Tensile strength of coated wire shall be not less than 80,000 pounds per square inch. Minimum weight of aluminum coating shall be .040 oz. per square foot of wire surface. Zinc coating shall have a minimum of 0.80 oz. of zinc per square foot of surface area.

G. Fabric Ties. Ties used to secure fabric to line posts shall be 6 gauge zinc coated steel wire | Rev 1

preformed to a "C" shape. Ties for securing fabric to tension wire shall be 9 gauge zinc coated hog rings. Rev 1

H. Bracing at End Corner and Pull Posts. Bracing at end corner and pull posts shall be 1-5/8 inches O.D. galvanized steel pipe weighing 2.27 lbs. per lineal foot.

I. Truss Rods. Truss rods shall be 3/8 inch diameter galvanized steel rod.

J. Tension Bars or (Stretcher Bars) Tension bars shall be 3/16 inch x 3/4 inch galvanized steel bar.

K. Galvanized Materials. Unless otherwise specified, galvanizing of accessory items shall be by the hot-dip process. Such materials which are indicated to be galvanized shall have a zinc coating per ASTM A123 or not less than 2.0 oz. per square foot of surface.

L. Miscellaneous Fittings. Provide all accessory items and miscellaneous fittings required for a complete installation. Accessories and miscellaneous fittings shall be galvanized steel or galvanized malleable iron.

2.02 GATES

A. Swing Gate Frames. Gate frames for swing type gates shall be fabricated of 1-7/8 inch O.D. galvanized steel pipe, weighing 2.72 pounds per foot, and frames internally braced to prevent sag.

B. Slide Gate Frames. Not Utilized

C. Fabric. Fabric material for gates shall be the same material as specified for fence. Secure to frames with tension bars and hook bolts.

D. Swing Gate Hardware. Hinges for swing type gates shall be galvanized malleable iron, bottom hinge being of ball and socket type designed to carry the weight of the gate.

Each gate shall be equipped with a positive type latching device with provisions for padlocking.

Double gates shall have center plunger rod catches.

Gates shall have semiautomatic outer catches to secure gates in open position.

E. Sliding Gate Hardware. Hardware shall be fence manufacturer's standard track, ball-bearing hanger sheaves, support framing, guides, stays, bracing and accessories as required by drawings.

F. Barbed Wire. Where indicated on the drawings, the top of gates shall have three strands of barbed wire of the same material and height as used on the fence.

Padlocks shall conform to drawings and shall have chains that are securely attached to the gate or gate posts. Padlocks shall be keyed alike and two keys shall be provided for each padlock.

2.03 CONCRETE MATERIALS

Provide concrete as specified under Construction Specification 03300.

2.04 TOUCH-UP PAINT

Touch-up paint shall conform to ASTM A 780 and applied per the manufacturer's requirements. Prepare surface to bare metal condition. Surface shall be clean, dry and free of surface contaminants prior to application of paint. Paint color shall match the color of the new galvanized fence and accessories. Existing surfaces shall be protected from paint dripping and/or overspray. *Rev 1*

2.05 MOTOR OPERATED CANTILEVER SLIDING GATES

A. General Requirements. Gate construction, gate back frames and support posts shall conform to details as shown on the drawings, and to the requirements previously specified herein. *Rev 1*

B. Electric Motor Operators. Electric motor operators shall be "1295 Slide Gate Operator", manufactured by Crown Industrial, or equal.

Electric motor operator shall consist of an instantly reversible gear motor solenoid brake, a safety friction disc clutch, an emergency release that can be locked open or closed, a reversing starter with overload protection, open and closed coils each with two (2) auxiliary normally open contacts and fully automatic limit switch. Operators shall be supplied with manufacturer's standard steel base, and weather-proof cover with padlock attachment.

Electric motors for gate operators, shall ½ Horsepower. Power requirements shall be as shown in the drawings.

Operators shall be furnished with required operating hardware, including but not limited to heavy-duty roller chains, sprockets, chain brackets and guides.

Push-button controls for electric motor operators shall be Nema 4 rated, Three-Button Stations, manufactured by Crown Industrial, or equal.

C. Guard Posts. Guard posts shall be concrete filled steel pipe, of size shown, with a concrete crown at the top of the posts, as shown on the drawings. *Rev 1*

2.06 GROUNDING

Grounding clamps shall be 3/8" cadmium-plated plus gold chromated steel U-bolt and nuts with cast bronze, plain-finish clamp. Ground wire shall be #4 AWG copper wire. Ground rod shall be 5/8" x 8' with a 6" projection and shall have a resistance to ground of 25 ohms or less. Provide additional ground rods per National Electric Code (NEC) requirements as necessary to meet the resistance specification. All fence grounding will be in compliance with section 16100 and the applicable NEC sections for fence grounding. The NEC shall govern if a conflict arises. *Rev 1*

PART 3 - EXECUTION

3.01 INSTALLATION OF CHAIN LINK SECURITY FENCE

Installation shall conform to ASTM F 567. Where the terrain along the fence run is uneven, perform grading to provide a uniform slope before erecting the fence. Unless otherwise indicated on the drawings, fence shall be 8 feet - 0 inches overall height, consisting of 7 feet - 0 inches wire fabric with top and bottom tension wires and three strands of barbed wire supported on 45° extension arms projecting away from the secured area. *Rev 1*

Space posts on 10 feet - 0 inches maximum centers and embed 3 feet - 0 inches in concrete footings.

Set posts plumb and to a uniform grade. All corner, ends, pull, gate, end panels of sloping runs and removal panel posts shall be braced. Space tension wires approximately 3 inches above bottom and below top of fabric, and secure to the fabric with 9 gauge galvanized steel hog rings spaced 24 inches maximum centers. Space tension bands and fabric bands on 14 inch maximum centers and fabric ties on 24 inch maximum centers. When complete, fabric and barbed wire shall be free from sags, posts straight and plumb, and gates shall swing or slide, and latch freely.

Anchor posts on concrete as indicated in the Drawings. Post and base plate welding shall conform to AWS D19.0-72. Anchor each welded post/base plate fabrication on smooth un-broken concrete surfaces. Install anchors per manufacturer's instructions. Repair concrete surfaces as necessary for a level anchoring surface. Install fence fabric and accessories as indicated in this Specification. *Rev 1*

All fencing hardware shall be installed on the inside of the secure area. All bolts shall be spot welded or peened.

Exposed surfaces resulting from field cuts, welding, and erection abrasions shall receive one (1) coat of galvanize-type touch-up paint. Metal base plates anchored to concrete shall receive one (1) coat of galvanize-type touch-up paint. *Rev 1*

3.02 GROUNDING *Rev 1*

Ground fence enclosures at diagonally opposite corners and at intervals not exceeding 500 feet.

Where an electric utility line rated 65kV or greater passes over the fence, fence shall be grounded at points 50 feet, measured horizontally, beyond where the outside conductors pass over the fence.

Where an electric utility line rated 65 kV or greater runs parallel to and within 40 feet of the fence, measured horizontally, fence shall be grounded at 50 feet maximum intervals along the parallel section of fence.

Fence post grounding shall consist of three grounding clamps, installed at the top, middle and bottom of the post, connected to the ground wire.

Fence grounding shall consist of conductors secured to the fence with compression connectors.

Provide ground road at each grounding point located on post side of fence as close as possible to post and

fence.

Grounding conductors shall be cad welded to the ground rod per applicable AWS standards. *Rev 1*

Provide flexible copper bonding jumper between fixed fencing and moveable elements such as gates.

Provide grounding as indicated per this Section or the drawings.

3.03 INSTALLATION OF ELECTRIC MOTOR GATE OPERATORS *Rev 1*

Electric motor operators shall be installed in strict conformance with the manufacturer's recommendations and in conformance with the approved shop drawings and wiring diagrams.

END OF SECTION

APPENDIX A
SUBMITTAL REQUIREMENTS

	CHAINLINK FENCE Reference Paragraph or Section	1.03	1.03	1.03	1.03	
When Receipt by CE Required	10 Days after Work Completion					X
	30 Days Prior to Work	X	X	X	X	
	5 Days Prior to Installation					
	30 Days Prior to Shipment					
	5 Days Prior to Shipment					
	30 Days Prior to Fabrication					
	5 Days Prior to Fabrication					
	Within 15 Days After Notice to Proceed					
	Monthly					
	Weekly					
	As Required					
Type of Submittal	For Record					X
	For Information					
	For Approval	X	X	X	X	
	For Review					
Description of Data Required		Shop Drawings	Wiring Diagrams	Safety Plan	Literature and Certificates of Compliance	As-Built Red Lines Documents